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Bulletin No. 131 - Variety Tests of Field Crops in Utah

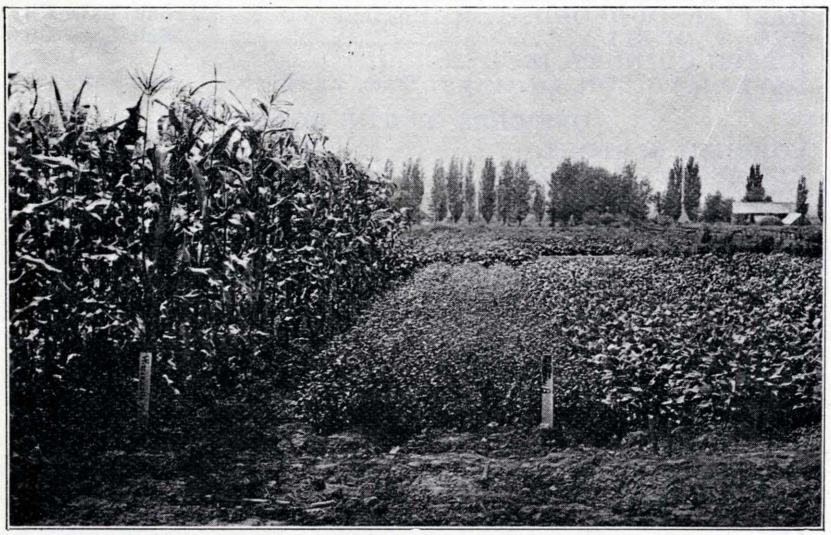
Frank S. Harris

J. C. Hogenson

Utah Agricultural College

EXPERIMENT STATION

Bulletin 131



Variety Tests of Field Crops in Utah

By FRANK S. HARRIS *and* J. C. HOGENSON

Logan, Utah, March, 1914

PRESS OF
THE F. W. GARDINER CO.
SALT LAKE

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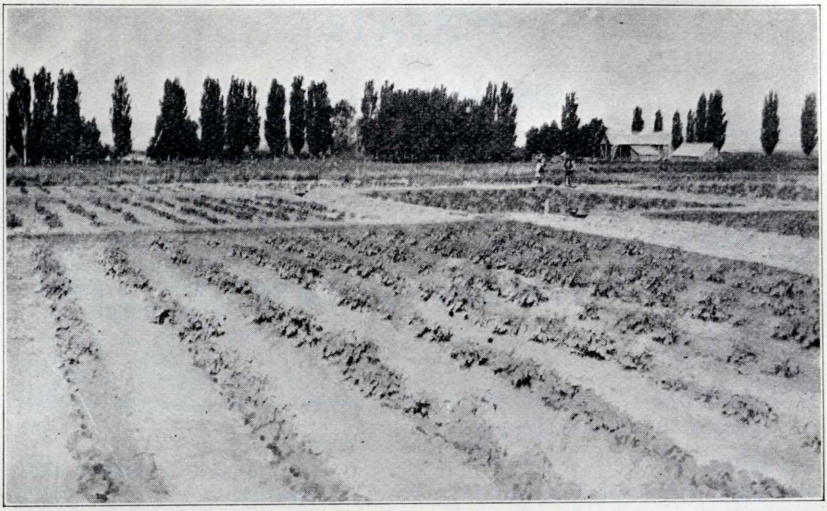
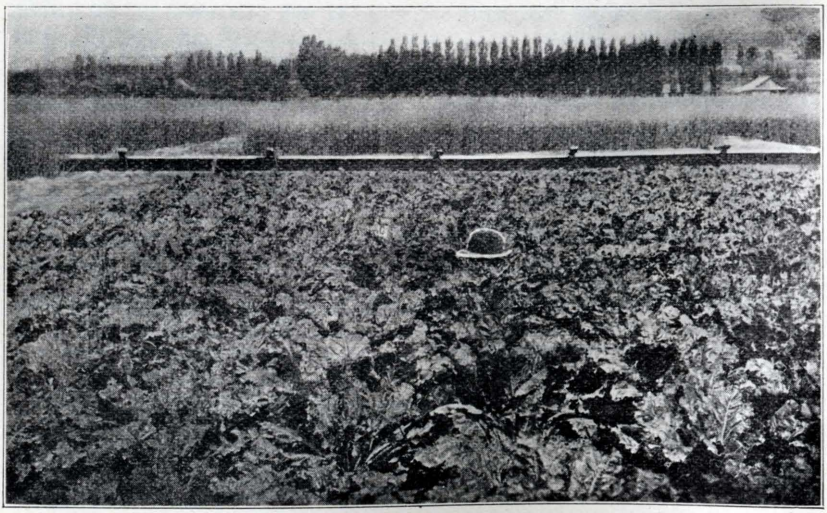


Variety Tests of Potatoes.



Test Plots at Greenville.

Variety Tests of Field Crops in Utah

By

Frank S. Harris and J. C. Hogenson

Acknowledgments.

The work reported in this bulletin was begun by Pres. J. W. Sanborn and Prof. A. A. Mills, and carried on by them and their associates during the first few years. It was later continued by Director Luther Foster and those associated with him. Probably more of the work has been done by Prof. L. A. Merrill than by any other individual. He was directly in charge of it till 1905, when the work was turned over to Prof. W. M. Jardine.

J. C. Hogenson had charge of the work from 1907 to 1911, since which time it has been carried on under the direction of F. S. Harris. Since 1905 Messrs. John Stephens, Erastus Peterson, A. E. Bowman and H. W. Stucki, who have been assistants in the Department of Agronomy, have each contributed to the work. The authors wish especially to acknowledge their indebtedness to Mr. Stucki for work in tabulating and checking the results.

Others who assisted have been given credit in the text.

VARIETY TESTS OF FIELD CROPS IN UTAH.

1. The Need of Variety Tests.

The number of varieties of practically all the field crops is now very great, and is increasing every year. Each variety has certain growers who believe in it and who do what they can to make it more widely grown. As a result many varieties of crops are found in most every farming community.

This condition is often bad, since it is impossible to build up a good market with a great mixture of varieties of any crop. A much better price can be obtained if each community offers for sale large quantities of a few standard types, rather than small lots composed of a large number of miscellaneous varieties.

Since it is not easy for the farmer to overcome his prejudice for his pet variety, it is difficult for the farmers of a community to make fair tests themselves and to compromise on a few varieties. This, taken with the expense of conducting any kind of experiment, makes it desirable for the experiment stations to conduct these tests and report their results to the farmers.

The chief reasons, therefore, for conducting variety tests are: First, to determine the strains that will give the greatest yields; second, to find the relative composition and value of the different varieties; and third, to aid in reducing the number of varieties raised in any community to a minimum.

TABLE No. 1—POTATO VARIETIES RAISED ON GREENVILLE FARM.

BUSHELS PER ACRE.

Variety.	1908	1909	1910	1911	1912	1913	Avg.
Admiral Dewey	-----	-----	-----	-----	-----	465	465
Idaho Rural	-----	-----	-----	-----	-----	457	457
Freeman	-----	-----	312	-----	384	600	432
Early Rose	-----	-----	-----	-----	394	408	401
Market Prize	-----	-----	-----	-----	368	391	380
Maggie Murphy	-----	-----	269	-----	399	451	373
Majestic	-----	-----	458	344	367	303	368
Pearl	-----	-----	335	-----	312	457	368
Delmany Challenge	-----	-----	385	343	-----	-----	364
Early Bangor	333	352	381	114	585	-----	353
Uncle Sam	-----	-----	319	-----	296	436	350
Peerless	280	305	318	334	-----	432	334
Farmer	-----	-----	292	-----	296	321	303
Sir Walter Raleigh	-----	-----	267	-----	290	332	296
Eureka	-----	227	335	223	338	293	283
Peach Blow	-----	-----	287	241	-----	-----	264
Early Russet	-----	-----	248	-----	-----	235	242
Early Six Weeks	278	298	313	163	172	183	235
Royal Dutchess	-----	-----	287	-----	216	187	230
Early Ohio	-----	-----	-----	-----	222	170	196
20th Century	-----	226	239	100	119	266	190
Hammond Wonder	-----	-----	300	72	-----	-----	186
Clover White	-----	-----	-----	-----	-----	119	119

2. Errors in Variety Tests.

Some of the methods that have been used in the past in making variety tests have caused this kind of experimentation to fall into disrepute among certain scientific men. The fact that the problem seemed so simple often led to careless and unscientific methods. Again where the methods of the experiment were all right in themselves, the conclusions that were drawn were often too far reaching.

Probably the most common source of error lay in the fact that conclusions were drawn from but one test during a single season. The great variations in soil require that a number of plats be used for each variety if anything like accurate information is to be obtained. One season may be favorable for one variety and the next for another. In order to be certain of results, therefore, tests should be conducted during a number of years.

Under irrigation another very serious source of error is likely to come from differences in the amount of water applied unless the water is measured. An additional difficulty arises in the fact that all varieties do not require the same amount of water for their best growth. If one amount of water is used as a standard a certain variety will lead, while if more or less water is applied the results will probably be different.

The origin of the seed must also be taken into account before exact comparisons can be made. A crop usually does better after it has had a few years in which to adjust itself to a new climate into which it has been taken.

Even where the experimental error has, by exact methods, been reduced to a minimum, care must be taken in applying the results to regions at any distance from the place where the experiment was conducted. There is no such thing as a best variety, of any crop for all conditions. As the climate and soil change the crop adaptation will be different. One variety is suited to wet, another to drouth; one likes a heavy soil, while another may do well on a more sandy type; one can endure great heat, while another grows better if the climate is cooler.

It is necessary, therefore, to determine for each set of conditions what varieties are best, and it is impossible to rely entirely on the results obtained on any one experimental farm. Tests conducted on a single farm may, however, be useful to a

TABLE No. 2—FALL WHEAT VARIETIES RAISED ON STATION FARMS NEAR LOGAN.

BUSHELS PER ACRE.

Variety.	'90	'91	'92	'93	'94	'95	'96	'97	'98	'00	'01	'02	'03	'04	'08	'09	'10	Avg.
Fultz																	47.9	47.9
Turkey Red											37.0	37.3	57.2	16.9	26.0	26.6	50.1	35.9
Gold Coin													47.5	12.3			43.9	34.6
Belogina													51.2	16.9				34.1
Red Chaff											34.0	39.1	58.0	3.8				33.7
Zimmerman											26.5	36.6	43.3	17.3				30.9
Sonora							33.4	15.3	38.3	43.6	19.4	30.7	40.0	20.8				30.2
Koffod										24.9	25.6	24.3			27.7	35.0	43.5	30.2
Early Ripe											26.5	34.1	35.8	17.1				28.4
Early Red Clawson							17.7	23.0	36.7	26.9	21.9	32.2	47.5	20.4				28.3
Tasmanian Red										24.2	24.5	33.3	45.0	12.9				28.0
Golden Cross									26.3		23.8	37.5	41.7	10.4				27.9
Theiss											28.6	30.3	30.4	21.7				27.8
Canadian Wonder								15.8	26.3	29.1	21.6	32.0	48.7	19.0				27.5
Dawson's Golden Chaff											29.5	25.4						27.5
Arcadian									31.3		28.6	22.4						27.4
Long Amber									24.3		32.1	24.7						27.0
Bearded Fife									36.0		17.4	27.3						26.9
Red Giant									32.7		18.6	29.2						26.8
Siberian										26.2	24.0	38.3	25.8	19.6				26.8
Emporium											25.3	27.5						26.4
Fulcaster											23.8	29.0						26.4
Tuscon Island											16.3	32.4	47.5	8.8				26.3
Poole											25.5	32.4	33.3	12.1				25.8
Medeah													42.9	8.3				25.6

Boyer											16.7	32.0	37.5	15.4				25.4
Marcounian													25.3					25.3
Genesee Giant											23.6	26.4						25.0
Nigger											20.3	29.6						25.0
Ramsey											24.5	32.0	30.0	11.7				24.6
Clawson's Longberry											20.0	29.0						24.5
Red Cross							23.6	16.6	32.0		20.3	32.0	31.7	14.8				24.4
Odessa					12.7	12.9	27.7	15.6	32.7		27.3	34.9	43.3	12.9				24.4
Pooling											22.4	25.6						24.0
Mediterranean		6.2								26.0	14.3	37.5	45.0	12.5				23.6
Early Arcadian											23.2	23.9						23.6
Dakota Chief									23.3									23.3
Lofthouse			15.1	15.6	11.8		25.9	18.2	27.3	16.8	33.6	33.0	36.0	19.4				23.0
Pride of Genesee									22.3		18.0	26.0						22.1
Canadian Hybrid											15.8	27.9						21.9
Oatka Chief									23.3		17.7	23.9						21.6
Currell											20.0	22.6						21.3
Ruby					6.9	11.8					21.8	38.8	30.8	12.1				20.4
Martin's Amber		7.8			9.3	15.6	22.5		22.3	14.5	20.8	32.6	41.7	14.6				20.2
World's Fair							14.1	8.3	26.7		21.8	26.2						19.4
Velvet Chaff	12.2	6.0	12.2								22.7	30.7	31.2	15.0				18.6
U. S. G. 7792													30.8	5.0				17.9
Diamond Grit										10.5	15.8	26.4						17.6
Rieti											9.0	25.1						17.1
Touse	16.4																	16.4
U. S. G. 8238													24.2	8.3				16.3
Royal Austrian										12.9	14.9	20.5						16.1
Valley											13.0	17.9						15.5
Campbell's White Chaff		13.3	20.4	18.5	12.7	8.2												14.6
Standard	12.8	10.2	17.6															13.5
U. S. G. 7580														12.5				12.5
U. S. G. 7578														5.8				5.8

TABLE No. 3—SPRING WHEAT VARIETIES RAISED ON THE STATION FARMS NEAR LOGAN.

BUSHELS PER ACRE.

Variety.	'90	'91	'92	'93	'94	'95	'96	'97	'98	'99	'00	'01	'02	'03	'04	'08	'09	'10	'11	Avg.
Defiance	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	48.1	48.1
Chul	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	43.8	39.9	50.3	44.7
Sonora Spring	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	41.3	35.8	38.6
Mahmondi	....	....	....	....	....	....	....	....	....	....	....	....	....	62.5	9.2	....	....	....	....	35.9
Yellow Ghanvoka	....	....	....	....	....	....	....	....	....	....	....	....	....	51.3	20.0	....	....	....	....	35.7
White Club	....	....	....	....	....	....	....	....	26.0	52.5	17.6	25.8	5.6	64.2	25.8	48.1	39.8	....	....	33.9
Pelissier	....	....	....	....	....	....	....	....	....	....	....	....	....	47.5	4.2	47.7	30.1	....	....	32.4
Egyptian Spring	....	....	....	....	....	....	....	....	....	29.8	6.0	24.2	30.3	25.0	8.3	37.2	24.2	....	....	30.8
Adjini 7580	....	....	....	....	....	....	....	....	....	....	....	....	....	44.8	16.3	....	....	....	....	30.6
Kahla 7794	....	....	....	....	....	....	....	....	....	....	....	....	....	55.8	2.1	....	....	....	....	29.0
Kahla 7581	....	....	....	....	....	....	....	....	....	....	....	....	....	43.3	12.5	....	....	....	....	27.9
Kubanka	....	....	....	....	....	....	....	....	....	....	28.8	6.0	....	....	....	45.6	29.2	....	....	27.4
New Zealand	....	....	....	....	10.8	10.7	....	....	24.3	....	22.0	22.8	25.7	48.3	18.0	21.9	53.6	42.5	....	27.3
Mohamed ben Bachir	....	....	....	....	....	....	....	....	....	....	....	....	....	37.7	15.7	....	....	....	....	26.7
Richi 7795	....	....	....	....	....	....	....	....	....	....	....	....	....	37.4	15.8	....	....	....	....	26.6
Improved Fife	....	25.8	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	25.8
U. S. G. 4643	....	....	....	....	....	....	....	....	....	....	....	23.8	....	36.3	16.7	....	....	....	....	25.6
Romanow	....	....	....	....	....	....	....	....	....	21.6	29.4	12.9	....	37.5	....	....	....	....	....	25.4

Black Don 8232	....	....	....	....	....	....	....	....	....	....	....	....	....	....	32.5	17.9	....	....	....	....	25.2
Nicaragua	....	....	....	....	....	....	....	....	....	....	....	33.0	13.2	5.3	52.5	20.0	....	....	....	....	24.8
U. S. G. 5644	....	....	....	....	....	....	....	....	....	....	....	....	28.2	8.8	43.8	17.9	....	....	....	....	24.7
Fretes	....	....	....	....	....	....	....	....	....	....	....	....	....	....	37.5	11.3	....	....	....	....	24.4
Whitington	....	15.6	14.4	17.1	24.2	....	32.4	7.8	39.3	32.2	13.6	21.4	10.9	15.7	27.5	51.1	35.6	....	....	....	23.9
Nox 53	....	20.0	13.3	19.0	17.3	....	33.1	8.1	44.7	20.2	31.3	....	6.2	50.4	22.5	....	....	....	....	....	23.8
Lamona	....	....	....	....	....	....	....	....	....	....	34.3	9.6	25.6	48.2	19.8	....	....	....	....	....	23.5
White Russian	....	12.0	14.1	14.0	15.1	....	19.4	10.3	42.2	48.7	23.3	24.5	10.6	40.8	15.8	....	....	....	....	....	22.4
U. S. G. 5645	....	....	....	....	....	....	....	....	....	....	....	25.6	13.3	38.3	12.5	....	....	....	....	....	22.4
U. S. G. 4642	....	....	....	....	....	....	....	....	....	....	....	22.3	....	....	....	....	....	....	....	....	22.3
Niagra	....	19.0	16.7	13.2	26.4	16.9	33.8	7.6	26.2	33.2	21.1	25.2	....	....	....	....	....	....	....	....	21.8
Wellman's Fife	....	....	....	....	....	....	....	....	....	....	32.5	12.0	8.0	35.0	19.2	....	....	....	....	....	21.3
Beryl	....	21.2	26.7	10.5	11.1	6.7	39.0	7.0	23.8	37.8	35.1	15.7	....	....	....	....	....	....	....	....	21.3
Gilling's Mixture	....	....	....	....	22.0	....	29.1	9.8	31.3	26.0	10.2	17.9	....	....	....	....	....	....	....	....	20.9
Dallas	....	11.1	6.7	17.8	15.1	11.4	....	....	41.8	14.7	33.1	19.4	9.1	47.0	22.5	....	....	....	....	....	20.8
Ruby	....	22.7	14.0	11.2	12.7	11.8	26.7	6.1	40.5	24.2	17.1	15.8	38.8	....	....	....	....	....	....	....	20.1
Northcote's Amber	....	14.7	17.8	12.0	14.8	14.3	18.5	6.8	36.4	11.6	16.7	23.2	25.1	60.8	7.5	....	....	....	....	....	20.0
New York Spring	....	8.0	13.1	17.9	14.0	....	22.9	8.2	38.7	33.1	15.1	24.4	....	....	....	....	....	....	....	....	19.5
Nox 153	....	20.4	13.3	....	....	....	....	....	....	....	....	22.7	....	....	....	....	....	....	....	....	18.5
Assiniboia Fife	....	....	12.4	14.4	16.4	12.2	30.0	4.0	13.1	39.8	9.1	9.6	....	43.3	14.2	....	....	....	....	....	18.2
Granite	....	28.9	12.2	10.5	22.2	20.2	29.8	4.0	29.4	12.2	10.9	17.9	....	....	....	....	....	....	....	....	18.0
Australian Club	....	21.2	13.8	14.9	20.0	14.4	....	....	....	....	....	....	....	....	....	....	....	....	....	....	16.9
Polish	....	17.2	10.6	....	....	6.0	....	....	....	....	21.0	....	....	....	....	25.3	19.7	....	....	....	16.6
Perodka	....	....	....	....	....	....	....	....	....	....	33.3	2.2	11.5	....	....	....	....	....	....	....	15.7
Ontario	....	13.8	8.4	15.6	21.1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	14.7
Amethyst	....	13.0	8.7	15.6	16.4	....	24.9	7.4	21.8	16.0	6.0	10.2	....	....	....	....	....	....	....	....	14.0
Saskatchewan Fife	12.2	7.1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	9.7

TABLE No. 4—OAT VARIETIES RAISED ON STATION FARMS NEAR LOGAN.

BUSHELS PER ACRE.

Variety	'90	'91	'92	'93	'94	'95	'96	'97	'98	'01	'02	'03	'04	'05	'06	'07	'08	'09	'10	'11	Avg.
White Foster	....	....	....	....	....	....	....	....	....	....	....	....	....	....	109.0	....	....	....	....	....	109.0
Minnesota No. 26	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	102.0	....	....	....	102.0
Sparrowbill	....	....	....	....	....	....	....	....	....	....	....	....	....	80.0	106.0	88.3	97.6	88.3	102.0	108.0	95.7
20 Row Colorado No. 9	....	....	....	....	....	....	....	....	....	....	....	....	....	80.8	82.0	118.0	....	....	....	....	93.6
Green Mountain	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	85.9	95.3	90.6
White Tartar	....	....	....	....	....	....	....	....	....	....	....	....	....	68.4	109.0	113.0	94.0	....	66.4	....	90.2
Sixty Day (from Russia)	....	....	....	....	....	....	....	....	....	87.2	....	....	....	....	....	....	....	....	....	....	87.2
Black Tartar	....	....	....	....	....	....	....	....	....	....	....	....	....	62.5	103.0	68.3	....	106.0	....	....	85.0
Reg. Swedish Select	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	72.5	88.3	93.8	84.9
Dun	....	....	....	....	....	....	....	....	....	....	....	....	....	83.7	103.0	62.5	....	....	....	....	83.1
Danish Oats	....	....	....	....	....	....	....	....	....	25.8	34.6	47.0	53.9	74.4	128.0	123.0	113.0	106.0	73.4	102.0	80.1
Myrick	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	78.1	78.1
Big Four	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	75.0	75.0
Sixty Day	....	....	....	....	....	....	....	....	....	....	39.2	32.8	53.1	78.5	84.4	123.0	105.0	....	....	....	73.7
Red Rust Proof	....	....	....	....	....	....	....	....	....	13.8	....	....	....	....	....	....	....	104.0	84.4	84.4	71.7
Kherson	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	60.8	37.2	99.2	....	65.7
Black American	....	....	....	....	....	....	....	....	....	23.6	25.9	57.0	58.6	....	....	....	....	108.0	....	102.0	62.5
White Canadian	12.6	22.9	23.7	41.6	52.9	59.8	84.0	46.2	24.8	26.6	21.3	65.6	48.4	100.0	93.9	123.0	86.1	106.0	79.7	70.3	59.5
Yankee Prolific	....	....	....	....	....	....	....	....	....	58.4	....	....	....	....	....	....	....	....	....	....	58.4
Giant	....	....	....	....	....	57.7	....	....	....	....	....	....	....	....	....	....	....	....	....	....	57.7
Great Northern	....	....	....	....	38.8	72.7	....	....	....	....	....	....	....	....	....	....	....	....	....	....	55.8
Lincoln	....	....	....	....	....	....	....	....	....	27.5	26.2	58.0	71.9	....	....	....	....	....	82.8	42.2	51.4
Board of Trade	....	....	....	....	....	....	....	....	....	46.4	35.2	46.9	71.1	....	....	....	....	....	....	....	49.9
American Banner	11.2	13.3	56.6	56.8	57.2	64.4	85.6	34.0	35.7	22.3	30.0	50.0	53.9	....	....	....	....	....	....	82.8	46.7
American Triumph	....	....	47.4	43.4	32.3	62.1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	46.3

Badger Queen	17.5	48.0	48.5	44.5	60.8	62.7	34.2	25.4	34.4	34.6	72.7	70.3									46.1
White Schonen	....	10.7	44.2	58.6	51.9	55.9															44.3
Prince Edward's Island	17.7	19.0	46.9	39.5	73.8	61.7	79.7	21.1	22.5	51.6	38.5	62.5	39.8								44.2
Clydesdale	19.4	24.8	41.0	41.1	38.8	64.4	76.7	17.0	23.1	68.8	32.9	67.2	59.4								44.2
Northwestern White	....	....	....	....	....	....	....	....	....	25.8	14.0	78.1	51.6								42.4
Thousand Fold	....	....	48.0	39.5	32.3	49.4															42.3
White Bonanza	....	....	40.4	31.4	38.4	57.2															41.9
Imp. White Russian	....	20.2	43.1	46.2	49.9	49.8															41.8
North Star	....	....	43.6	42.5	35.0	38.1															39.8
Black Prolific	....	19.8	42.6	36.9	42.6	56.6															39.7
Nameless Beauty	....	....	....	....	....	60.8	69.6	31.8	28.2	5.2											39.1
Bonanza	....	25.5	22.6	43.4	39.4	58.2															37.8
Wide Awake	17.9	26.3	28.0	53.1	38.8	65.0	72.6	19.6	38.0	5.7											36.5
U. S. G. 2788	....	....	....	....	....	....				36.1											36.1
Japan	19.4	25.1	26.9	42.9	47.9	60.5				24.1											35.3
American Beauty	....	....	....	46.9	38.4	51.7															34.3
White Belgian	20.0	20.6	25.3	34.6	38.8	55.6				30.9	21.9	58.0									34.0
Race Horse	15.6	23.2	24.3	43.4	42.8	47.8															32.9
Early Dakota	....	16.4	24.8	44.3	34.2	42.7															32.5
Welcome	29.7	....	....																		29.7
Standard	18.2	20.8	40.7																		26.6
Red Georgian	....									21.8											21.8
Black Norway	20.8																				20.8
Progress	19.8																				19.8
U. S. G. 2800	....									19.8											19.8
Golden Sheaf	....									17.2											17.2
Horse Mane	16.6																				16.6
Dakota Northern	16.0																				16.0
White Side	....									13.8											13.8
Golden Giant Side	13.7																				13.7
White Swede	12.0																				12.0
Pnobstier	....									5.7											5.7

TABLE No. 5—BARLEY VARIETIES RAISED ON STATION FARMS NEAR LOGAN.

BUSHELS PER ACRE.

Variety.	'90	'91	'92	'93	'94	'95	'96	'97	'98	'99	'01	'02	'03	'04	'06	'07	'08	'09	'10	'11	Avg.
Tennessee Winter	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	79.1	.....	79.1
Black Hull-less	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	75.0	.....	.....	.....	75.0
Hull-less	....	....	....	....	....	....	....	....	....	....	....	....	....	35.4	73.9	80.2	52.3	72.4	....	.....	62.9
Chavalier	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	.....	.....	46.9	77.6	62.3
Beardless	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	55.2	46.8	53.1	77.1	.....	58.1
Salzer's California Prolific	....	....	14.0	22.3	28.7	19.4	53.6	12.9	38.2	....	39.2	37.2	44.3	41.2	....	....	89.0	69.3	.....	.....	39.2
Highland Chief	19.2	....	....	....	....	36.4	52.5	4.2	53.1	....	32.1	24.5	46.9	46.9	....	....	.....	.....	.....	.....	35.0
California	....	....	....	....	....	....	....	....	26.7	....	43.1	13.5	50.0	30.2	....	....	.....	.....	.....	.....	32.7
Blue	....	5.6	59.6	11.5	35.0	29.1	33.5	....	....	....	....	....	....	37.0	....	....	.....	.....	.....	.....	30.1
New Zealand	....	....	17.2	17.1	35.0	29.0	41.1	....	....	....	....	....	....	....	....	....	.....	.....	.....	.....	27.9
Black Barley	....	20.6	25.3	13.5	38.3	7.5	44.6	....	....	....	....	....	22.9	33.3	....	....	.....	.....	.....	.....	25.8
Manshury	....	....	16.3	15.6	24.7	25.0	56.9	10.4	18.0	....	11.1	24.1	32.3	33.3	....	....	.....	.....	.....	.....	24.3
Success	....	....	....	....	....	....	....	9.4	20.9	....	23.6	20.2	44.8	22.4	....	....	.....	.....	.....	.....	23.6
Nepaul	10.4	7.0	41.1	24.3	17.1	17.9	31.1	....	....	....	....	....	....	....	....	....	.....	.....	.....	.....	21.3
Silver King	....	....	....	....	....	....	....	....	15.1	....	16.9	23.6	32.3	16.7	....	....	.....	.....	.....	.....	20.9
Champion Two-rowed	18.9	....	....	18.9	....	....	....	....	....	....	....	....	....	....	....	....	.....	.....	.....	.....	18.9
Standard	10.0	12.8	23.9	15.6	....	....	....	....	....	....	....	....	....	....	....	....	.....	.....	.....	.....	15.6

farmer located under different conditions, but they must not be taken as final.

3. Kinds of Work Reported.

It was desired to secure light on the question of the best varieties of crops for Utah from as many sources as possible. The work is, therefore, divided into a number of classes.

The most important work in the bulletin is a report of the numerous tests that have been carried on at the Experimental Farms of the Station near Logan. These results extend over a period of more than twenty years and include many varieties.

The second phase of the work was taken up in co-operation with farmers in various parts of the State. Seed from a common source was sent to farmers who were instructed in the methods of conducting the tests. While the results in some cases were not altogether satisfactory, still the data obtained in this manner is both interesting and useful.

A reproduction is made of some tables already published in Bulletin No. 30 of the U. S. Department of Agriculture, by P. V. Cardon. These results were obtained at the dry-farm sub-station at Nephi by the Utah Experiment Station in co-operation with the U. S. Department of Agriculture. This reproduction is made as the previous publication is not available to all who may be interested in it.

The fourth division of the work was obtained by correspondence, as it was thought desirable to compare the experimental results with the findings of practical farmers. The replies of the farmers are given in tabular form.

4. Tests on Experimental Farm Near Logan.

Variety tests have been made with field crops at the Utah Experiment Station since 1890. The results of a number of these have been published in earlier Reports and Bulletins of this Station, but they are here repeated for the sake of comparison.

Prior to the year 1902 the variety tests were conducted on bench land just east of the College buildings. The soil is a loam from one to two feet deep underlaid with gravel. The shallowness and irregularity of this soil detract from the value of the earlier tests. Since the date mentioned above practically all the variety tests have been conducted on what is known as the

TABLE No. 6—CORN VARIETIES RAISED ON STATION FARMS NEAR LOGAN.

BUSHELS PER ACRE.

Variety.	'90	'91	'92	'93	'94	'95	'96	'97	'98	'99	'01-4	'05	'06	'07	'08	'09	'10	'11	'12	'13	Avg.
Wisconsin No. 7	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	144	144.0
Australian White Flint	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	120	157	139.0
Wisconsin No. 12	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	135	135.0
Jumbo Flint	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	130	130.0
Improved Lemming	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	88.6	142	116.0
N. S. C. B. Selection 133	....	....	....	....	....	....	....	....	....	....	....	....	....	97.0	....	87.3	....	....	....	....	92.2
Rustler's White Dent	....	....	....	....	....	....	....	....	....	....	....	67.1	107.	80.0	74.2	....	....	....	....	....	82.1
Queen of Nishna	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	53.7	75.0	95.0	....	74.6
Dakota Sunshine	....	....	....	....	....	....	....	....	....	....	....	88.4	....	75.2	....	83.6	50.7	....	....	....	74.5
Early Tuscorora	....	....	....	....	....	....	....	....	....	....	....	58.1	65.4	69.6	....	83.2	....	....	....	....	69.1
Triumph Yellow Flint	....	....	....	....	....	....	....	....	....	....	....	54.6	55.8	97.3	....	66.6	....	....	....	....	68.6
Yellow Flint	....	....	....	....	....	....	....	....	....	....	....	....	....	76.8	....	59.6	....	....	....	....	68.2
Golden Ideal	....	....	....	....	....	....	....	....	....	....	....	40.3	65.8	81.4	....	81.3	....	....	....	....	67.2
Minnesota	....	....	....	....	....	....	....	....	....	....	....	44.2	58.7	88.7	....	75.3	....	....	....	....	66.7
Gehn Yellow Flint	....	....	....	....	....	....	....	....	....	....	....	62.1	....	70.7	....	....	....	....	....	....	66.4
North Dakota White Flint	....	....	....	....	....	....	....	....	....	....	....	44.9	52.5	82.0	77.9	68.5	....	....	....	....	65.2
90-Day Yellow Flint	....	....	....	....	....	....	....	....	....	....	....	32.6	55.0	72.3	69.3	73.8	....	....	....	....	60.6
Iowa Gold Mine	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	58.6	....	....	58.6
Moores Premium	....	....	....	....	....	....	....	....	....	....	....	35.4	....	82.9	....	57.2	....	....	....	....	58.3
Northwestern Dent	....	....	....	....	....	....	....	....	....	....	....	53.9	....	59.1	....	72.8	30.6	....	....	....	54.1

Sterling	....	....	....	....	....	....	....	....	....	....	....	52.8	....	....	....	....	....	....	....	....	52.8
North Dakota Golden Dent	....	....	....	....	....	....	....	....	....	....	....	41.9	....	66.1	52.7	48.9	....	....	....	....	52.4
Rhode Island White Flint	....	....	....	....	....	....	....	....	....	....	....	48.7	....	71.8	....	....	22.1	....	....	....	47.5
Silver Mine	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	56.4	67.1	16.4	....	46.6
White Flint	48.6	43.9	41.7	36.2	41.2	50.0	67.5	43.0	45.8	43.9	....	....	....	....	....	....	....	....	....	....	46.2
Diamond Joe's Big White	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	48.6	40.0	44.3	....	44.3
White Rice Pop	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	43.6	....	....	....	43.6
Angel of the Midnight	34.0	37.3	28.5	22.4	37.3	28.5	62.0	57.2	43.6	31.4	....	....	....	....	....	....	....	....	....	....	38.2
North Dakota	....	....	....	24.9	36.9	37.6	48.9	51.6	32.4	30.6	....	....	....	....	....	....	....	....	....	....	37.6
Golden Dew Drop	....	....	....	22.6	33.2	40.4	43.5	46.9	35.8	39.2	....	....	....	....	....	....	....	....	....	....	37.4
Squaw Corn	....	....	....	23.5	33.6	38.2	50.7	41.5	33.5	36.6	....	....	....	....	....	....	....	....	....	....	36.8
Salzer's Earliest Can. Y. Dent	....	....	....	28.5	....	....	30.7	52.7	33.8	34.5	....	....	....	....	....	....	....	....	....	....	36.0
Mastodon	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	42.9	37.1	25.0	....	35.0
Striped Flint	....	....	....	....	....	....	....	....	....	....	....	....	....	35.0	....	....	....	....	....	....	35.0
Wis. Early White Dent	....	....	14.1	37.6	30.7	30.2	34.1	58.1	34.7	37.4	....	....	....	....	....	....	....	....	....	....	34.6
King Philip	8.5	4.6	....	31.2	54.6	45.6	57.0	44.4	38.0	25.9	....	....	....	....	....	....	....	....	....	....	34.4
Long Yellow Dent	....	....	13.7	....	....	....	39.2	47.6	24.2	45.5	....	....	....	....	....	....	....	....	....	....	34.0
Long Yellow Flint	25.0	28.4	23.6	26.7	31.4	38.2	43.7	46.2	33.8	29.8	....	....	....	....	....	....	....	....	....	....	32.7
Queen of the North	....	....	....	19.1	34.4	34.4	42.6	47.3	23.8	24.3	....	....	....	....	....	....	....	....	....	....	32.3
Clark's Early Mastodon	21.2	....	24.7	17.0	35.4	30.5	37.8	62.7	24.4	31.4	....	....	....	....	....	....	....	....	....	....	31.7
King of the Earlies	22.1	27.2	24.5	20.4	32.2	25.3	35.4	64.6	38.0	25.9	....	....	....	....	....	....	....	....	....	....	31.6
Early Huron Dent	....	....	....	20.9	34.8	28.4	33.3	45.0	24.0	27.4	....	....	....	....	....	....	....	....	....	....	30.5
Queen of the Field	25.4	2.2	34.9	21.8	32.8	35.5	37.3	47.9	33.5	29.8	....	....	....	....	....	....	....	....	....	....	30.1
Champion White Pearl	19.3	18.1	22.0	14.6	23.6	30.0	36.8	62.6	24.9	39.2	....	....	....	....	....	....	....	....	....	....	29.1
Square Deal	....	....	....	....	....	....	....	....	....	....	....	....	....	28.8	....	....	....	....	....	....	28.8
Hickory King	5.3	....	20.4	11.4	27.9	28.4	24.1	29.5	21.6	42.4	....	....	....	....	....	....	....	....	....	....	23.4
Queen Golden Pop	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	22.1	....	....	....	22.1
Red Beauty Pop	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	19.3	....	....	....	19.3

TABLE No. 7—BEAN VARIETIES RAISED ON GREENVILLE FARM.

BUSHELS PER ACRE.

Variety	1910	1911	1912	1913	Avg.
Tepary	------	------	------	54.3	54.3
Little Wonder Navy	37.5	40.0	38.7	------	38.7
White Flageolet	25.0	26.7	37.3	44.9	33.5
Long Yellow Six Weeks	------	11.3	35.4	45.9	30.9
Choice Navy	20.0	18.3	39.4	44.9	30.7
White Kidney	25.0	15.0	35.5	43.8	29.8
Boston Yellow Eye	16.7	21.3	40.3	33.4	27.9
Lazy Wife	------	------	14.5	38.6	26.6
White Marrow	12.5	14.2	26.3	48.0	25.3
White Wax	10.0	------	33.7	------	21.9
Kentucky Wonder	------	------	14.5	26.1	20.3
Kidney Wax	------	20.0	------	------	20.0
Bush Lima	11.7	------	------	------	11.7
Prolific Tree	3.3	------	------	------	3.3

Greenville Experiment Farm, situated one and one-half miles north of the College buildings. The soil of this farm is fully described in Bulletin No. 115 of this Station. It has an even, loamy texture to a great depth, and is well adapted to this kind of work.

a.—Potatoes.

Twenty-three varieties of potatoes have been tested since 1908. Some varieties have been grown for only one year, however, while others have been grown for six years.

In the accompanying table the varieties are placed according to yield, those giving the highest yield being placed first. In the one year tests the Admiral Dewey stands first and the Idaho Rural second. In the two year tests the Early Rose stands first and Market Prize second. In the three year tests the Freeman stands first, Maggie Murphy second, and the Pearl third. In the four year tests the Majestic stands first. In the five year trials Early Bangor stands first, Peerless second and Eureka third.

From the above data we may conclude that it is impossible to select the best yielding variety by a one year test, but in order

to arrive at conclusions of any value the crop must be grown for a number of years.

The Majestic potato stands, after a number of years trial, well to the front in point of value, with the Freeman and the Eureka following closely. It will be noted that the Early Ohio, one of the favorite potatoes among the farmers of the State, stands near the foot of the list.

b. Fall Wheat.

Varieties of fall wheat have been tested since 1890. In these tests, leaving out the Fultz, which was grown for only one year, the Turkey Red heads the list for irrigated farms. The Gold Coin stands second. Fifty-eight varieties were tested.

c. Spring Wheat.

The Defiance wheat heads the list, but was grown for only one year. The Chul comes next with a three years test. It produced more than Defiance when they were grown together. Then follow Sonora Spring and the White Club each with good yields. The New Zealand, although it does not come near the top of the list, is still a splendid wheat when quality is taken into consideration. In some sections it is grown as a fall wheat. Forty-four varieties were tested.

d. Oats.

The tests with oats have been carried on since 1890. In all fifty-eight varieties have been grown. The White Foster and Minnesota No. 26 head the list but have been grown for only one year. The Sparrowbill with a seven-year record is the variety that leads all others, while the Tarter, Danish, Regenerated Swedish Select and White Canadian are other good leading varieties.

e. Barley.

It will be noted in the table that the three varieties that head the list were tested for only one year. Hull-less barley was tested for five years and really heads the list. Chavalier stands second and Beardless third. Twenty-four varieties were tested.

f. Corn.

Forty-eight varieties of corn have been tested since 1890. Of these the Australian White Flint has given the best yield

for the two years it has been tested. The table shows the order of yield in which the varieties stand.

g. Beans.

Beans ought to be grown more extensively under irrigation than they are, because they bring splendid returns and are easily grown. According to the table the Tepary bean, the seed of which came from Arizona, stands in the lead, but with only a one year record. The Little Wonder Navy and the White Flageolet also gave good yields, with a number of other varieties following closely.

5. Dry-Farm Cereals at the Nephi Sub-Station.

For a number of years tests have been made at the Nephi dry-farm sub-station by the Utah Experiment Station and the Bureau of Plant Industry, U. S. Department of Agriculture, working in co-operation. The results for different varieties have been summarized by Mr. P. V. Cardon and recently published in Bulletin No. 30 of the U. S. Department of Agriculture.

A number of the tables of that publication are reproduced here in order that farmers may have available data regarding varieties for dry-farms as well as for their irrigated fields. Those wishing to make a detailed study of the question should by all means secure a copy of the original publication. Earlier results obtained at this sub-station have been published as Circular No. 61 of the Bureau of Plant Industry, U. S. Department of Agriculture, and Bulletin No. 112 of the Utah Experiment Station.

The Nephi sub-station is located in Juab County, Utah, at an elevation of 6,000 feet. It has an annual precipitation of about 13½ inches, coming mostly during the winter and spring. The soil ranges from a deep clay to a sandy loam, which in its native condition is covered with a heavy growth of sagebrush.

The varieties of wheat are arranged in order of their yield. The tables are presented without comment except some of the remarks made by Mr. Cardon in the summary of his bulletin. The C. I. No. refers to the number given the variety by the Office of Cereal Investigations.

Some of Mr. Cardon's conclusions are as follows:

"The varietal tests on plats have included 105 cereal varieties and strains. There were 68 varieties and strains of winter wheat, 1 of winter oats, 3 of winter barley, 2 of winter

TABLE No. 8—ANNUAL AND AVERAGE YIELDS OF 60 VARIETIES OF WINTER WHEAT AT THE NEPHI SUBSTATION IN A 4-YEAR-TEST, 1908 TO 1911, INCLUSIVE.

RANKED ACCORDING TO THEIR AVERAGE ACTUAL YIELDS.

Rank	C. I. No.	Variety	Yield (bushels per acre)				
			1908	1909	1910	1911	Avg.
1	1437	Crimean	30.33	18.66	20.30	26.70	23.99
2	1442	Kharkof	26.16	19.16	17.00	27.20	22.38
3	1439	Ulta	28.33	18.00	17.50	24.70	22.13
4	2998	Turkey	35.00	16.16	*15.80	†21.45	22.10
5	1559	Crimean	29.16	14.00	15.20	29.70	22.01
6	1435	.....do....	25.83	20.33	15.30	25.20	21.66
7	1558	Turkey	26.16	19.66	12.30	28.50	21.65
8	2979	Alberta Red	34.33	14.33	12.80	24.20	21.41
9	1787	Japanese	25.50	23.33	12.30	24.20	21.33
10	1438	Ghirka Winter	27.66	15.66	12.20	29.50	21.25
11	1355	Armavir	28.33	21.33	14.00	21.00	21.16
12	2048	Bulgarian	32.50	13.00	7.80	31.20	21.12
13	1571	Turkey	33.00	15.33	20.50	14.70	20.88
14	1583	Kharkof	31.00	10.66	21.20	20.50	20.84
15	1563	Weissenberg	32.66	13.83	16.30	20.30	20.77
16	1436	Crimean	30.16	14.66	15.50	22.20	20.63
17	1562	Bacska	34.00	13.00	16.70	17.70	20.35
18	2034	Hungarian	31.33	12.50	8.50	27.70	20.01
19	1756	Hard winter (Mo.)	32.16	17.33	11.50	19.00	19.99
20	1560	Banat	22.66	14.50	13.50	27.90	19.64
21	1432	Crimean	30.66	11.16	14.50	22.00	19.58
22	3055	Turkey	34.16	12.33	5.30	26.40	19.55
23	2908	Malakof	31.50	11.33	11.70	23.30	19.46
24	1564	Pesterboden	30.00	11.66	18.00	19.00	19.44
25	2996	Gold Coin	27.66	17.00	10.70	21.20	19.14
26	1676	Servian	22.66	15.66	10.50	27.40	19.05
27	1783	Hard winter (Okla.)	29.83	11.50	9.00	25.00	18.83
28	2042	Hungarian	32.66	8.83	8.80	24.70	18.75
29	1656	Roumanian	24.50	10.00	15.50	24.50	18.62
30	1532	Red Russian	21.83	14.66	14.80	22.70	18.50
31	2999	White Club	28.00	8.16	5.80	31.50	18.36
32	1667	Beloglina	33.33	9.33	13.50	17.20	18.34
	1824	Zimmerman × Turkey	30.00	3.16	9.70	30.50	
33	2906	Currell	19.66	21.83	10.70	20.70	18.22
34	1433	Crimean	27.50	8.66	13.00	23.30	18.11
35	1662	Roumanian	25.66	13.50	16.70	16.50	18.09
36	1561	Theiss	24.50	7.83	14.50	25.50	18.08
37	1395	Diehl Mediterranean	27.16	10.66	8.70	25.40	17.98
38	1658	Roumanian	23.33	11.16	13.80	23.30	17.90
39	2907	Zimmerman	24.83	10.33	11.30	24.30	17.69
40	1739	Budapest	21.16	12.66	7.30	25.50	16.65
41	3000	Bluestem	25.83	6.50	7.00	26.70	16.51
42	1539	Torgova	11.00	16.50	14.20	23.50	16.30
43	1596	Fretes	17.33	14.50	6.30	26.20	16.08
44	1544	Beloglina	15.00	15.16	12.00	21.50	15.91
45	3019	White Australian	20.50	10.66	3.50	27.00	15.41
46	1788	Japanese Square Head	23.50	9.66	4.30	21.50	14.74
47	1691	Bosnian	19.16	9.00	8.30	20.80	14.31
48	1543	Beloglina	10.16	12.16	8.80	24.90	14.00
49	2997	Koffod	17.78	2.49	.80	32.70	13.44
50	1757	Japanese Velvet Chaff	23.50	9.66	4.30	15.10	13.14
51	2086	Pelissier	26.00	12.83	.50	3.80	10.78
52	2100	Black Don	17.50	4.83	.50	15.50	9.58
....	1784	Hard Winter (Okla.)	26.33	2.33	2.50	Discarded.	
....	2985	Bluestem	14.33	4.83	2.33		
....	2986	California Gem	15.50	3.33	.80		
....	3001	Silver Club	11.00	3.66	.50		
....	3018	Salt Lake Club	13.83	11.66	1.00		
....	3274	Odessa	.....	11.16	10.00	24.20	.....
....	3275	Lofthouse	.....	3.33	11.50	27.30	.....

*Average of 23 checks. †Average of 22 checks.

TABLE No. 9—ANNUAL AND AVERAGE YIELDS OF 28 VARIETIES OF WHEAT GROWN AT THE NEPHI SUBSTATION FOR FIVE YEARS, 1908 TO 1912, RANKED ACCORDING TO THEIR AVERAGE ACTUAL YIELDS.

Rank	C. I. No.	Variety.	Yield (bushels per acre).					
			1908	1909	1910	1911	1912	Avg.
1	1437	Crimean	30.33	18.66	20.30	26.70	19.50	23.10
2	2998	Turkey	35.00	16.16	*15.80	†21.45	22.10	22.10
3	1442	Kharkof	26.16	19.16	17.00	27.20	19.80	21.86
4	1559	Crimean	29.16	14.00	15.20	29.70	19.90	21.59
4	1355	Armavir	28.33	21.33	14.00	21.00	22.30	21.59
5	2048	Bulgarian	32.50	13.00	7.80	31.20	22.80	21.46
6	1438	Ghirka Winter	27.66	15.66	12.20	29.50	22.10	21.42
7	1435	Crimean	25.83	20.33	15.30	25.20	19.10	21.15
8	1571	Turkey	33.00	15.33	20.50	14.70	22.10	21.13
9	2979	Alberta Red	34.33	14.33	12.80	24.20	19.70	21.07
10	1583	Kharkof	31.00	10.66	21.20	20.50	21.40	20.95
11	1787	Japanese	25.50	23.33	12.30	24.20	18.40	20.75
12	1436	Crimean	30.16	14.66	15.50	22.20	19.30	20.36
13	1563	Weissenberg	32.66	13.83	16.30	20.30	17.70	20.16
14	1562	Bacska	34.00	13.00	16.70	17.70	17.80	19.84
15	1756	Hard Winter (Mo.)	32.16	17.33	11.50	19.00	17.80	19.56
16	1564	Pesterboden	30.00	11.66	18.00	19.00	18.30	19.39
17	2034	Hungarian	31.32	12.50	8.50	27.70	16.90	19.38
18	1656	Roumanian	24.50	10.00	15.50	24.50	22.00	19.30
19	1432	Crimean	30.66	11.16	14.50	22.00	16.00	18.86
20	1439	Ulta	28.33	18.00	17.50	24.70	5.80	18.85
21	2908	Malakof	31.50	11.33	11.70	23.30	15.30	18.63
22	1676	Servian	22.66	15.66	10.50	27.40	16.80	18.60
23	1783	Hard Winter(Okla.)	29.83	11.50	9.00	25.00	17.50	18.57
24	1560	Banat	22.66	14.50	13.50	27.90	13.80	18.47
25	3055	Turkey	34.16	12.33	5.30	26.40	13.90	18.42
26	1532	Red Russian	21.83	14.66	14.80	22.70	14.70	17.74
27	2996	Gold Coin	27.66	17.00	10.70	21.20	10.10	17.33

*Average of 23 check plats. †Average of 22 check plats.

emmer, 10 of spring wheat, 7 of spring oats, and 14 of spring barley."

"The winter varieties of all cereals have given better results than have the spring varieties."

"Of the winter wheat varieties, the hard red group has given the best yields. The soft white group, commonly grown in the Intermountain States, is comparatively low in yield."

"The Turkey variety (C. I. No. 2998), the leading hard winter wheat at the sub-station for several years, is the most satisfactory of the winter wheats. It has been used as a check variety for a number of seasons. Only one variety, Crimean (C. I. No. 1437), ranks higher in actual yield, but its rank is based on the yield of a single plat each year, while the rank of the Turkey is based on an average of several plats."

TABLE No. 10—ANNUAL AND AVERAGE YIELDS OF FOUR VARIETIES OF DURUM AND FIVE VARIETIES OF COMMON SPRING WHEAT AT THE NEPHI SUBSTATION FOR FIVE YEARS, 1908 TO 1912.

C. I. No.	Variety.	Yield (bushels per acre).						
		1908	1909	1910	1911	1912	Average. 1908 to 1910	Average. 1908 to 1912
	Durum Wheat.							
1440	Kubanka	10.0	11.5	2.0	7.3	5.3	7.8	7.2
2088	Kahla	12.0	9.7	3.2	7.0	6.6	8.3	7.7
2087	Mohamed ben Bachir.	8.0	8.8	2.2	6.0	6.3	6.3	6.3
1594	Adjini	12.5	7.8	2.2	5.5	4.1	7.5	6.4
	Average	10.6	9.5	2.4	6.5	5.6	7.5	6.9
	Common Wheat.							
1517	Ghirka Spring	13.3	5.3	.2	....	....	6.3	.....
2398	Galgalos	12.0	9.7	.3	....	....	7.3	.....
3035	Mexican No. 1	22.7	8.7	.6	....	....	10.7	.....
3036	Mexican No. 2	12.7	11.7	1.0	....	....	8.5	.....
3056	New Zealand Spring	23.3	10.5	2.0	....	....	11.9	.....
	Average	16.8	9.2	.8	....	....	8.9	.....

TABLE No. 11—ANNUAL AND AVERAGE YELDS OBTAINED IN VARIETAL TESTS OF SPRING OATS AT THE NEPHI SUBSTATION, 1908 TO 1912.

C. I. No.	Variety.	Yield (bushels per acre).								
		1908	1909	1910	1911	1912	Average. 1908 to 1909	Average. 1909 to 1911	Average. 1910 to 1912	Average. 1908 to 1912
549	Black American	15.6	15.6	8.4	11.6	25.3	15.6	11.9	15.1	15.3
568	Giant Yellow	9.7	16.3	6.9	12.2	21.4	13.0	11.8	13.5	13.3
165	Sixty-Day (Nephi)	16.0	15.0	* 2.8	2.8	15.3	15.5	6.1	7.0	10.4
165	Sixty-Day (Highmore).	†48.8	§18.5	....	....	....	33.6	....	....	....
134	Swedish Select	†44.1	*15.4	¶ 6.2	8.8	24.1	28.3	10.1	13.0	19.7
459	Kherson	....	16.6	0.6	5.9	....	....	7.7	....	....
	New Roosevelt	....	....	10.9	§11.5	26.6	....	....	16.3	....
	Average	26.8	16.2	5.9	8.8	22.5	21.2	9.5	13.0	14.7

* Average yield of 5 plats.

† Grown on land which had been fallow for two years. All the other varieties were grown in 1908 on plats which had produced wheat the previous season.

§ Average yield of 3 plats.

¶ Average yield of 4 plats.

TABLE No. 12—ANNUAL AND AVERAGE YIELDS OF WINTER BARLEY GROWN AT THE NEPHI SUBSTATION, 1909 TO 1912, INCLUDING SUMMARY OF MISCELLANEOUS DATA.

C. I. No.	Variety	Average stand		Average date		Height	Yield per acre						Ratio of weight of gain to straw	Avg. weight per bushel
							Grain (bushels)					Straw (4-year average)		
		Plants per acre	Comparative	Headed	Ripe		1909	1910	1911	1912	Average			
		M.	*P.ct.*	June	July	*In.*						*Cwt.*		*Lbs.*
592	Utah Winter.	133	130	20	14	24	*22.0	9.8	32.7	†13.8	19.6	9.9	1:1.00	45
257	Tennessee Winter . . .	89	80	22	21	24	18.1	16.5	24.6	4.1	15.8	6.4	1: .90	45
	Average..	111	100	21	18	24	20.0	13.1	28.6	8.9	17.7	8.2	1: .95	45

*Average of 2 plats. †Average of 4 plats.

TABLE No. 13—ANNUAL AND AVERAGE YIELDS OF SPRING BARLEY GROWN AT THE NEPHI SUBSTATION FOR THREE YEARS, 1908 TO 1910.

Variety.	Yield (bushels per acre)				
	1908	1909	1910	Average.	
				1908-1910	1909-1910
California	13.3	7.7	1.4	7.5	4.5
California Prolific	20.2	7.7	1.2	9.7	4.4
Hooded Hull-less	16.0	4.2	. . . . .	6.7	2.1
Average.	16.5	6.5	.9	8.0	3.7

"The average acre yield of spring wheats since 1908 is only 7.5 bushels for durum varieties, and 8.9 bushels for common varieties, which is unprofitable in comparison with the acre yield of 17 to 23 bushels from winter wheats."

"Boswell winter oats have yielded very well in some seasons. In other seasons the yield has been low, thus reducing the average acre yield to 17.2 bushels for 1909 to 1912." This variety always yielded well during seasons when it did not

winter kill, and low yield was due to poor stand. However, the variety gives great promise as a winter oat for the intermountain region.

"The Black American, Giant Yellow, and Swedish Select varieties of spring oats have acre yields of 15.2, 14.2, and 13.6 bushels, respectively, in 1909 to 1912, inclusive."

"Two winter varieties of barley have given promising results. Of these two, Utah Winter (C. I. No. 592) has yielded an average of 19.6 bushels per acre, as against 15.8 bushels for Tennessee Winter (C. I. No. 257.)"

"Three spring varieties were practically failures, and were discarded in 1910."

"Black Winter emmer has shown itself adapted to conditions at Nephi, and probably will prove a valuable crop on the dry-farms of the Mountain States. There was no apparent difference during 1912 between Buffum's Improved Black Winter emmer (C. I. No. 3331) and the ordinary Black Winter emmer (C. I. No. 2337)."

It might be said in further explanation of the varieties of wheat that the Crimean, the Alberta Red and a number of the other good yielders belong to the same group as the Turkey, and would be known to the farmer as Turkey Red wheat. This makes even clearer the fact that the best wheats for the dry-farms of the Great Basin are the hard winter wheats.

The chief reason why the varieties planted in the fall do better than those planted in the spring is probably that in this region the greater part of the precipitation of the year comes during the winter, and the winter varieties are able to utilize this moisture more advantageously than those planted in the spring. If the winter oats can be made to resist winter killing they usually yield better than the spring oats, but in localities where winter killing is frequent it may not be possible to get a good stand of oats to live over winter.

6. Co-operative Variety Tests.

It was thought desirable to have a number of good farmers in different parts of the State make tests of a few varieties of potatoes, corn and beans. The Experiment Station furnished the seed, which all came from the same lot. A record book and a set of instructions were sent to each farmer in order that the methods of raising the crops would be as uniform as possible.

TABLE No. 14—YIELD OF POTATO VARIETIES RAISED BY FARMERS—1912 AND 1913.

BUSHELS PER ACRE.

Variety.	College Farm Logan Bench Land		J. P. Holmgren Bear River City	Mental Hospital Provo H. W. Crockett	W. L. Winn Smithfield	L. A. Ball Greenville	J. B. Walker Sandy	L. F. Boyle Cornish	T.G.Humphrey Salina
	1912	1913	1912	1912	1912	1913	1913	1913	1913
Sir Walter Raleigh	303	569		281	132	170	218	378	
Maggie Murphy	413	216		116		228	267	630	
Freeman	378	220				213		953	
Majestic	289	285	136	351	220	165	290	401	456
Eureka	219	346	288	256		237	305	238	225
Market Prize	262	269	201	298	372	145	258	407	
Uncle Sam	268	135	100	249		120			
Early Ohio	202	143	161	303	440	45	233	198	89
Early Six Weeks	190	109	70	123	328	38	192	166	108
Royal Dutchess		106	128	78	127		250		423
20th Century	119	154	68	44		158	306	119	218
Early Russet	174	102	68	190	106	135	327	189	269

TABLE No. 14—YIELD OF POTATO VARIETIES RAISED BY FARMERS—1912 AND 1913. (Continued).

BUSHELS PER ACRE.

Variety.	College Farm Logan Bench Land		J. P. Holmgren Bear River City	Mental Hospital Provo H. W. Crockett	W. L. Winn Smithfield	L. A. Ball Greenville	J. B. Walker Sandy	L. F. Boyle Cornish	T.G.Humphrey Salina
	1912	1913	1912	1912	1912	1913	1913	1913	1913
Clover White	244	85		118		153			
Early Rose		91	292	118	462	58	275	677	322
Pearl		290		218	191		287	87	297
Idaho Rural		127				320	242	947	
Farmer		232							
Drouth Proof		275							
Blue Victor		95							
Mortgage Lifter		252							
Mechaenic		54							
Bliss Triumph		89							
Ohio Junior		251							
Peerless			208	237	436	212			299

TABLE No. 15—YIELD OF CORN VARIETIES RAISED BY FARMERS—1912 AND 1913.

BUSHELS PER ACRE.

Variety.	College Farm Logan	H. W. Crockett State Mental Hospital, Provo	J. P. Holmgren Bear River City	J. P. Sharp Deweyville
	1912	1912	1912	1913
Australian White Flint	132.0	64.6	49.7	36.1
Pride of the North	70.0	45.3		
King of the Earlies	77.0	28.3	42.9	28.3
Dakota Sunshine		53.3	47.5	27.8
Improved Lemming	56.0	45.3	42.2	17.2
Northwestern Dent		29.5	62.0	23.9
Mastodon		37.4		
Jumbo Flint				34.7
Queen of Nishna		30.6		
Silver Mine		11.3		
Iowa Gold Mine		4.5		

The method used was to first plant one row of each variety, then, arranged in the same order as the first, to plant another row of each variety. This was continued till all the land devoted to the experiment was covered. This placed a row of each variety in a number of parts of the field, thereby helping to overcome irregularities in the soil.

The results vary so much that caution must be used in drawing any conclusions. It is impossible to make averages that are consistent, so the tables are presented without averages, which might have been misleading.

a. Potatoes.

Potatoes were raised during 1912 and 1913 on the bench land east of the College building, the instructions given to the farmers being followed. During 1912 potatoes were also tested by J. P. Holmgren, Bear River City, Boxelder County; H. W. Crockett at the State Mental Hospital, Provo, Utah County; and W. L. Winn, Smithfield, Cache County; and during 1913 they were tested by L. A. Ball, Greenville, Cache County; J. B. Walker, Sandy, Salt Lake County; L. F. Boyle, Cornish, Cache County; and T. G. Humphrey, Salina, Sevier County.

The table shows that no one variety was best during all seasons or in all localities, but a number of the varieties were almost always high while some were uniformly low.

TABLE No. 16—BEAN VARIETIES RAISED BY FARMERS 1912 AND 1913.

BUSHELS PER ACRE.

Variety.	College Farm Logan	L. A. Ball Greenville	H. W. Crockett Mental Hospital Provo
	1913	1913	1912
Lazy Wife		36.4	
White Flageolet	32.4	57.9	11.9
Long Yellow	23.7		
White Kidney	22.4	32.2	13.9
White Marrow	23.7	36.4	6.6
Boston Yellow Eye	18.7	39.7	6.6
Choice Navy	22.4	25.7	6.6
White Wax	16.8		14.5
Kentucky Wonder	16.2	15.0	
Kidney Wax		17.1	8.6
Little Wonder Navy			6.6

At the College farm in **Logan** the Sir Walter Raleigh, Maggie Murphy, Eureka, Majestic, Market Prize and Freeman all did real well.

At **Bear River City** the Early Rose, Eureka and Market Prize were in the lead.

At **Provo** the Majestic, Early Ohio, Market Prize and Eureka did better than the others.

At **Smithfield** Early Rose, Early Ohio, Market Prize and Early Six Weeks produced good yields.

At **Greenville** Idaho Rural, Eureka, Maggie Murphy, and Freeman gave the best yields.

At **Sandy** Early Russet, 20th Century, and Eureka did best.

At **Salina** Majestic, Royal Dutchess, and Early Rose were the leading varieties.

At **Cornish** Idaho Rural, Freeman, Early Rose, and Maggie Murphy were in the lead.

b. Corn.

Corn varieties were raised at Logan, Provo and Bear River City in 1912, and at Deweyville, Boxelder County, in 1913.

Of the corn varieties Australian White Flint has done the best. Dakota Sunshine and Jumbo Flint have also found favor where they have been raised.

TABLE NO 17—VARIETIES OF WHEAT, OATS, BARLEY, CORN AND POTATOES SELECTED BY FARMERS AS BEING BEST, WITH NUMBER OF TIMES EACH WAS SELECTED.

Wheat	No. Times Chosen	Oats	No. Times Chosen	Barley	No. Times Chosen	Corn	No. Times Chosen	Potatoes	No. Times Chosen
Turkey Red	41	Swedish	12	Blue	13	White Flint	29	Early Ohio	15
Gold Coin	13	Boswell	5	Club	4	Yellow Dent	12	Pearl	12
Red Chaff	11	Roosevelt	3	Six-Row	3	Yellow Flint	6	Eureka	8
Lofthouse	9	Ninety Day	3	Utah Winter	3	White Dent	3	Peerless	7
Club	9	Horse Mane	3	Tenn. Winter	2	Kentucky Yellow Dent	1	Early Rose	7
Koffod	8	Napoleon	2	Pearl	2	Pride of the North	1	Red Willard	5
Odessa	7	New Market	1	Two-Row	2	Iowa Silver Mine	1	Machaenic	3
Blue Stem	4	Idaho	1	California	1	Dakota Sunshine	1	Idaho Rural	2
California Club	4	White Russian	2	Bulgarian	1	Sweet Corn	1	Vulcan	2
Touse	4	Golden Fleece	1	Winter Club	1			Burbank	2
Fife	3	Golden Giant Side	1					Early Six Weeks	2
Sonora	2	Lincoln	1					Netted Gem	2
Early G. Giant	1	Montana	1					Blue Victor	1
Dawson's Golden Chaff	1							White Star	1
New Zealand	1							Rural New Yorker	1
Golden Fleece	1							Mortgage Lifter	1
Martin's Amber	1								
Siberian Club	1								
Crimean	1								

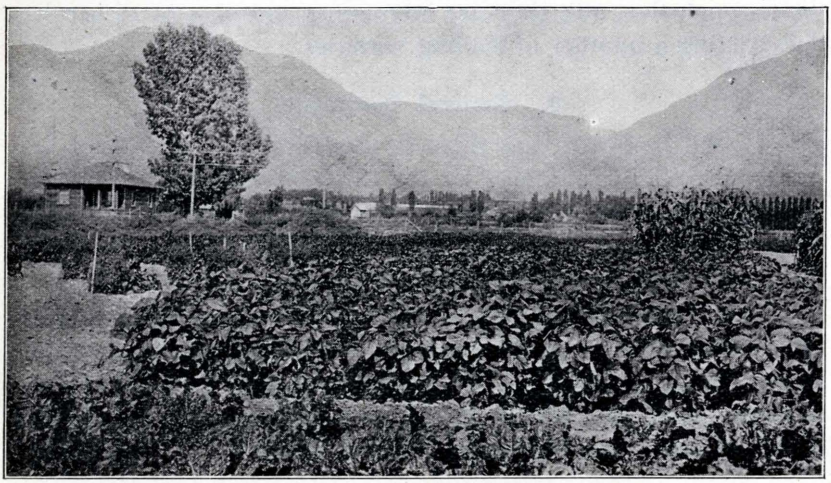
c. Beans.

Results for beans were not obtained from all to whom seed was sent. Only one test in 1912 is given and two tests in 1913.

White Flageolet was the best variety in most cases, but a number of other varieties gave very satisfactory yields.

7. Correspondence with Farmers.

In order to discover what varieties of the common field crops were preferred by farmers in different parts of the State, inquiries were sent out to 500 good farmers in different counties, asking them to state what three varieties of wheat, oats, barley, corn and potatoes they considered best adapted to their conditions.



Test Plots at Greenville.

The inquiries were not all answered, but the replies that were received came from the counties as follows: Boxelder 41, Cache 29, Davis 3, Emery 15, Iron 13, Grand 1, Juab 39, Piute 13, Millard 42, Rich 8, San Juan 3, Summit 10, Tooele 14, Uintah 18, Utah 13, Wasatch 16, Washington 16, Wayne 5, and Weber 18.

This includes both irrigated and dry-farms. An attempt was at first made to differentiate the two, but so many farmers classed the two together that we found it necessary to do the same. Some of the farmers reported on but one crop, so each crop does not show the same number of reports.

On examining the table it will be seen that Turkey Red wheat is easily in the lead in the minds of the farmers. Next follows Gold Coin, Red Chaff, Lofthouse and Club.

With oats, Swedish is well ahead, followed by Boswell. The Blue is the favorite barley, with Club coming second.

With corn the exact names of varieties were not given in many cases, but it is shown that some of the white flint varieties are preferred by more than half of the farmers who expressed themselves.

In potatoes there is not such a great lead by any one variety. Early Ohio, Pearl, Eureka, Peerless and Early Rose all have a number of friends.

While the results of these answers from the farmers are far from conclusive, still they are interesting and may be of service in selecting a number of leading varieties.

8. General Comment.

It will be noted that there is no very close agreement between the results obtained by the different methods of investigating relative variety yields. This makes clear the fact that it is dangerous to draw any far-reaching conclusions from variety tests made in just one place and during a single season.

It is probable that where there is any great disagreement the results obtained at the Station farms should be given considerably more weight than the results obtained by co-operating farmers, since the Station has greater facilities for conducting accurate work and eliminating varying factors.

9. Summary.

1. This bulletin gives data on the yields of different varieties of wheat, oats, barley, corn, potatoes and beans.

2. The information was obtained from the following sources: 1st, the Station farms near Logan; 2nd, the dry-farm sub-station at Nephi; 3rd, co-operative tests with a number of good farmers in different parts of the State; and 4th, correspondence with a large number of farmers.

3. As a result of the tests it is impossible to say exactly what varieties are best, but with each crop there are a number of varieties that do well under almost all circumstances.

4. The individual tables should be studied before making a decision regarding the varieties to plant.